Shear Wave Velocity of $MgSi0_3$ Perovskite up to 8 GPa and 400°C	X17B1

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High quality polycrystalline specimens of the $MgSiO_3$ perovskite have been synthesized in a 2000-ton multianvil split-sphere apparatus (USSA-2000) at 26 GPa and 1350°C using glass as the starting material. The perovskite structure has been confirmed by Raman spectroscopy and X-ray diffraction analyses from the ends of the cylindrical specimens. After polishing the specimens under liquid nitrogen (to protect them from morphization) we performed pilot acoustic experiment at room temperature to the pressures up to 5 GPa in a 1000-ton uniaxial split-cylinder apparatus (USCA-1000) press. The acoustic quality of perovskite specimen was to be excellent at elevated pressure, but the acoustic echoes were barely observable at room pressure, most likely due to the large grain size of synthesized material (up to 50 microns). Two subsequent experiments have been performed in a DIA-type, cubic anvil apparatus (SAM 85) installed on the superconducting wiggler beamline (X17B) at the National Synchrotron Light Source of the Brookhaven National Laboratory. The coustic measurements were performed simultaneously with in-situ X-ray diffraction monitoring of the perovskite sample and NaCl standard, which was used to determine the pressure. (Liebermann et al., 1997, AIRAPT). The temperature was measured by two thermocouples and the gradient determined to be less than 10C/mm. As a result of these experiments, the shear elastic modulus of $MgSiO_3$ perovskite has been measured as a function of temperature and pressure for the first time.